#4020
ok

WATER QUALITY MEMORANDUM
Utah Coal Regulatory Program

September 28, 2012

TO: Internal File

THRU: Steve Christensen, Permit Supervisor

FROM: Ken Hoffman, Hydrologist

RE: 2012 First Quarter Water Monitoring, PacifiCorp, Deer Creek Mine. C/015/0018, Task ID #4020

The Deer Creek Mine monitoring plan is described in Appendix A of Volume 9 of the MRP.

1. Were data submitted for all of the MRP required sites? YES ☒ NO ☐

Many sites were not accessible during the First Quarter 2012.

2. Were all required parameters reported for each site? YES ☒ NO ☐

3. Were any irregularities found in the data?

Listed parameters were more than two standard deviations from the mean.

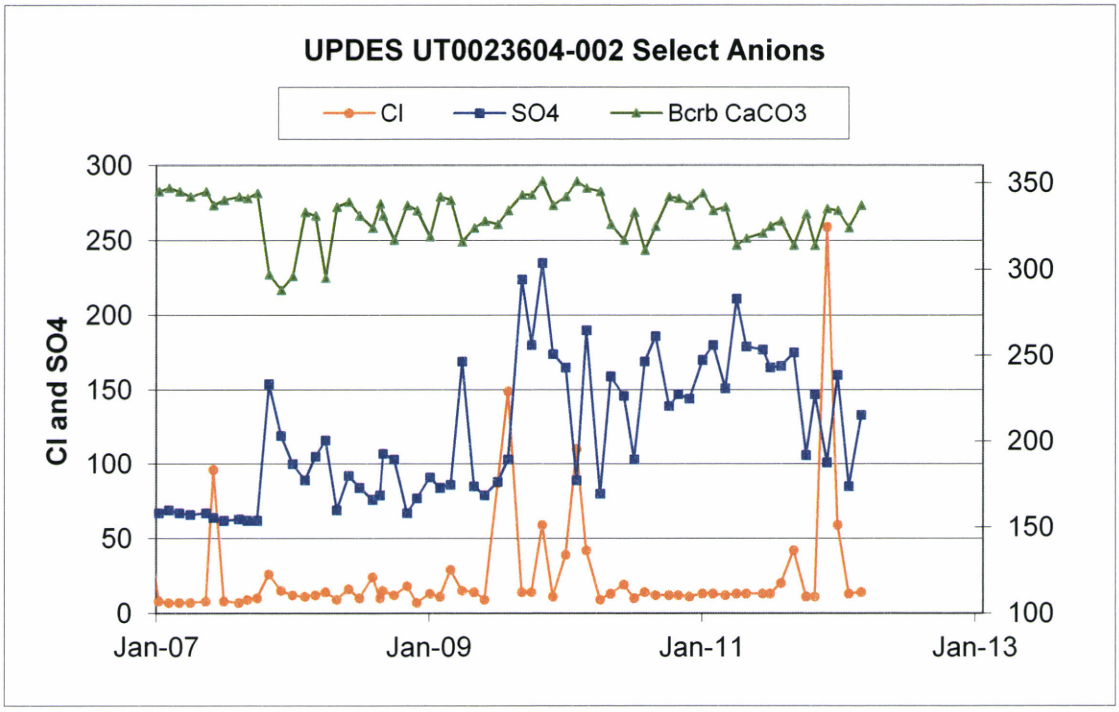
Streams YES ☒ NO ☐

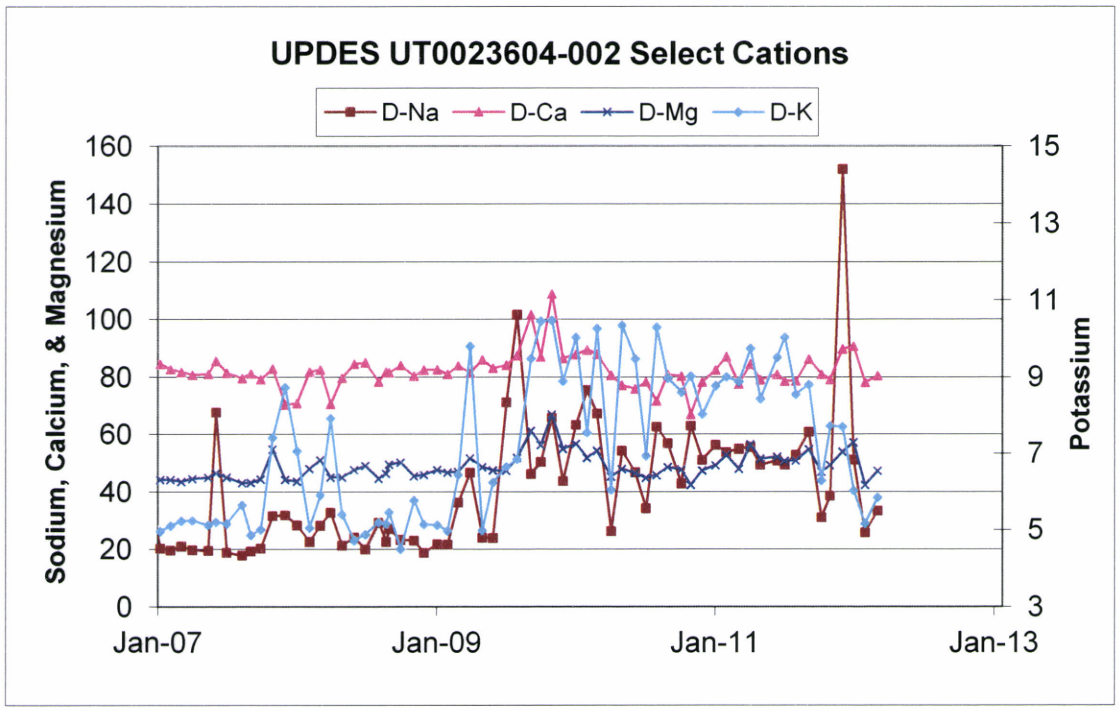
DCR04 Flow - January, February, March 2012
DCR06 Flow - January, February, March 2012
HCC01 March 2012 - carbonate

UPDES YES ☒ NO ☐

UPDES 002 March 2012 - cation-anion balance

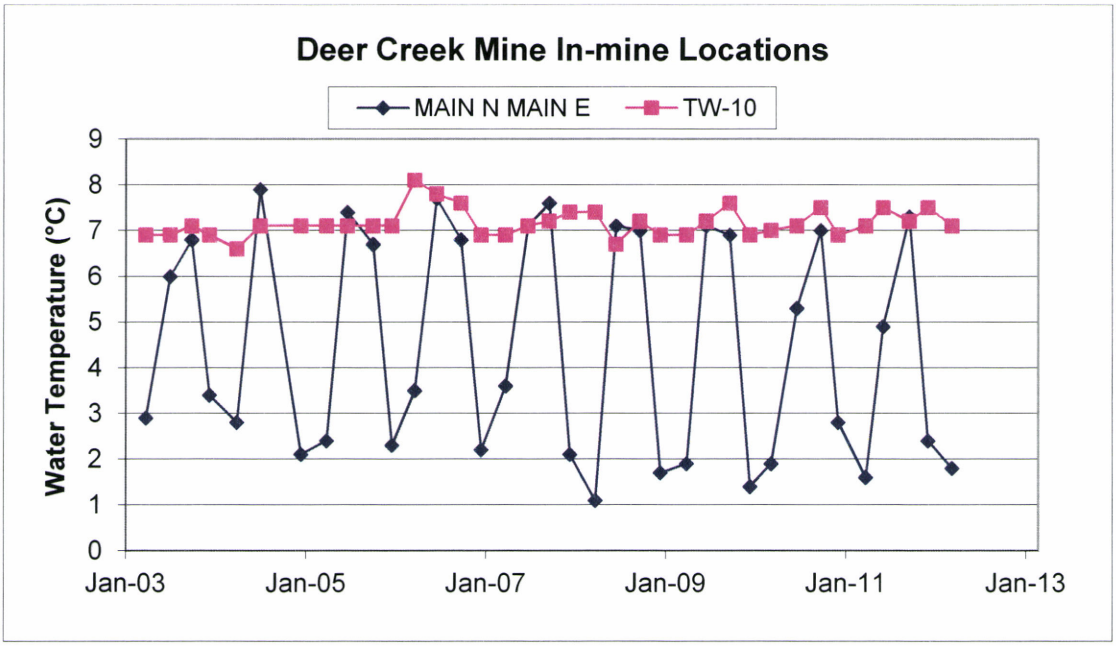
Recently, potassium values have frequently been outside two standard deviations from the mean at UT0023604-002, but – as can be seen on the following charts – with the exception of bicarbonate, major ion concentrations have tended to fluctuated upwards in recent years. In addition, spikes in chloride and dissolved sodium and a dip in dissolved potassium have occurred over the past two quarters.


UPDES UT0023604-002 Select Anions
Cl
SO4
Bcrb CaCO3
Cl and SO4
300
250
200
150
100
50
0
350
300
250
200
150
100
Jan-07
Jan-09
Jan-11
Jan-13


UPDES UT0023604-002 Select Cations
D-Na
D-Ca
D-Mg
D-K
Sodium, Calcium, & Magnesium
160
140
120
100
80
60
40
20
0
Potassium
15
13
11
9
7
5
3
Jan-07
Jan-09
Jan-11
Jan-13

In-mine YES ☐ NO ☒

The water temperature at Main North Main East varies seasonally year-after-year (see following chart), indicating that this in-mine source is most likely fed by infiltration of surface water rather than draining surrounding strata. The temperature at TW-10 shows some seasonal variation but it is not as definitive as at Main North Main East.

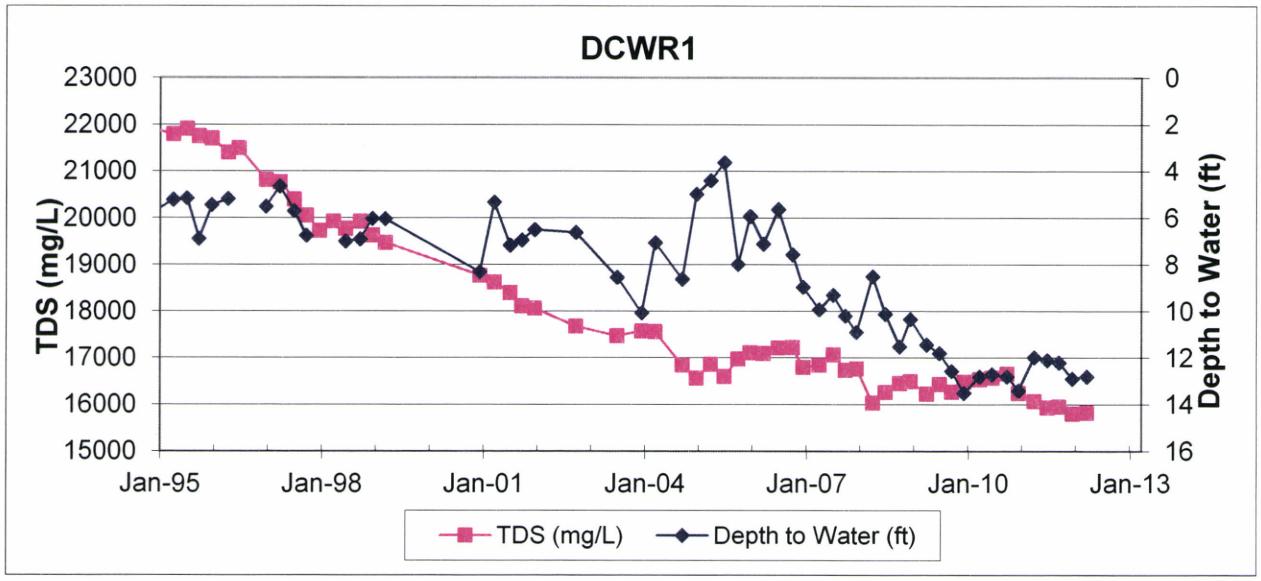


Springs YES ☐ NO ☒

Wells YES ☒ NO ☐

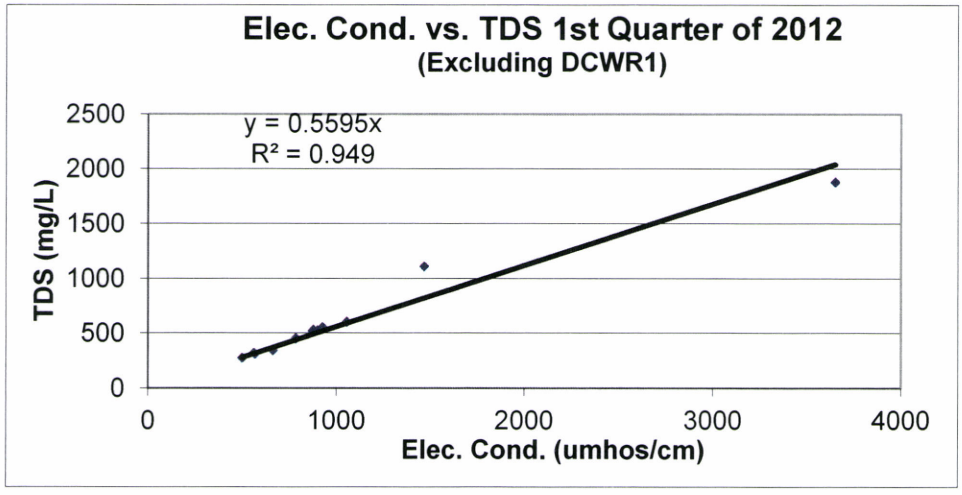
DCWR1 March 2012 - field pH (meter error)

Although it hasn't been flagged as varying from the mean by more than two standard deviations, water level at DCWR1 has been dropping since 2006 (following a small rise in 2004-2005). TDS was dropping at a similar rate, but now appears to have stabilized. These changes are probably from factors other than disposal of waste rock at this site: a similar drop in water level is seen at WCWR1 at the Cottonwood/Wilberg Mine Waste Rock Disposal Site.



TDS/field electric conductivity ratios – all sites

The TDS/field electric conductivity ratio typically falls between 0.52 and 0.76 for dissolved solids concentrations found in natural waters. As the following chart shows, data for these two parameters submitted for the First Quarter 2012 at the Deer Creek Mine generally result in a ratio that falls within this range: DCWR1 is not included in the trendline calculation.



4. On what date does the MRP require a five-year resampling of baseline water data.

Baseline analyses were performed in 2001, 2006 and 2011 and are to be repeated every 5 years. Baseline analyses will next be conducted in 2016.

5. Based on your review, what further actions, if any, do you recommend?

There is no indication of trends or extremes in any of the parameter values. No further action recommended at this time.

6. Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements? YES ☐ NO ☒

7. Follow-up from last quarter, if necessary.

None.

8. Did the Mine Operator submit all the missing and/or irregular data (datum)?

NA.

O:\015018.DER\Water Quality\Deer wq 12-1st.docx